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Studies of Neotropical Caddisflies, XLI: New Species and Records of *Austrotinodes* (Trichoptera: Psychomyiidae)

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Abstract.—Fourteen species are described in the Neotropical genus *Austrotinodes*: *chihuahua* (Mexico), *contubernalis* (Panama), *freytagi* (Honduras, Belice), *neblinensis* (Venezuela), *ancylus* (Ecuador), *tuxtlensis* (Mexico), *fortunata* (Panama), *canoabo* (Venezuela), *fuscomarginatus* (Venezuela), *ariasi* (Brazil), *amazonensis* (Brazil), *bracteatus* (Brazil), *prolixus* (Brazil), and *nielseni* (Argentina). Variations in the male genitalia are discussed for *sedmani* Flint, newly recorded for Costa Rica and Panama, and further records of *panamensis* Flint and *paraguayensis* Flint are presented.

The genus *Austrotinodes* was established in 1955 by Schmid for two species, *latior* (type species) and *angustior,* both described from Chile. Since then nine species have been described from Chile and adjacent Argentina (Flint, 1969, 1973, 1983; Schmid, 1958, 1964), and two Chilean species of Navas, *Tinodes lineata* and *T. talcana,* have been transferred to the genus (Schmid, 1955). Both of the latter species were described from females, but Flint has studied the type of *talcana* and compared it to associated females of several regional species, discovering it agrees perfectly to those of *latior,* which species becomes a synonym of *talcana.* In 1973 Flint reviewed the known species of the genus, describing the first three species from outside the Chilean Subregion, the larvae and pupae, and placing the genus in the subfamily Ecnomiinae (many workers regard this taxon as a distinct family). A single species was described from Paraguay (Flint, 1983), but material in our collections indicate that the genus is actually widespread, but generally infrequently encountered, throughout the Neotropical Region north into the southwestern United States and the islands of Cuba and Hispaniola. Those herein described increase the number of named species in the genus to 31. In 1983 Waltz and McCafferty recorded a larva of the genus from central Texas, the first record from the United States.

In this paper we are describing new species from Mexico, Belice, Honduras, Panama, Venezuela, Ecuador, Brazil, and Argentina as well as discussing the variation in the male genitalia of *A. sedmani* and presenting distributional data for others. In order to aid other workers, we are presenting a list of the species known in *Austrotinodes,* and their known distributions (new country records are presented in capital letters).

[1] Dr. D. G. Denning died suddenly on 7 February 1988 while this paper was in its final editing stage.

Austrotinodes amazonensis Flint and Denning, n. sp.—BRAZIL.
Austrotinodes ancylus Flint and Denning, n. sp.—ECUADOR.
Austrotinodes angustior Schmid, 1955—ARGENTINA, Chile.
Austrotinodes ariasi Flint and Denning, n. sp.—BRAZIL.
Austrotinodes armiger Flint, 1983—ARGENTINA, Chile.
Austrotinodes bracteatus Flint and Denning, n. sp.—BRAZIL.
Austrotinodes brevis Schmid, 1955—Chile.
Austrotinodes canoabo Flint and Denning, n. sp.—VENEZUELA.
Austrotinodes cekalovici Flint, 1969—Chile.
Austrotinodes chihuahua Flint and Denning, n. sp.—MEXICO.
Austrotinodes contubernalis Flint and Denning, n. sp.—PANAMA.
Austrotinodes cubanus Kumanski, 1987—Cuba.
Austrotinodes fortunata Flint and Denning, n. sp.—PANAMA.
Austrotinodes freytagi Flint and Denning, n. sp.—BELICE, HONDURAS.
Austrotinodes fuscomarginatus Flint and Denning, n. sp.—VENEZUELA.
Austrotinodes irwini Flint, 1973—Chile.
Austrotinodes lineatus (Navas), 1934—Chile.
Austrotinodes mexicanus Flint, 1973—Mexico.
Austrotinodes neblinensis Flint and Denning, n. sp.—VENEZUELA.
Austrotinodes nielseni Flint and Denning, n. sp.—ARGENTINA.
Austrotinodes panamensis Flint, 1973—Panama.
Austrotinodes paraguayensis Flint, 1983—BRAZIL, Paraguay.
Austrotinodes picada Flint, 1983—Chile.
Austrotinodes prolixa Flint and Denning, n. sp.—BRAZIL.
Austrotinodes quadrispina Schmid, 1958—Chile.
Austrotinodes recta Schmid, 1964—ARGENTINA, Chile.
Austrotinodes recurvatus Flint, 1983—Chile.
Austrotinodes sedmani Flint, 1973—COSTA RICA, Guatemala, PANAMA.
Austrotinodes talcana (Navas), 1934—Chile.
(*A. latior* Schmid, 1955, new synonym.)
Austrotinodes triangularis Schmid, 1958—Chile.
Austrotinodes tuxtlensis Flint and Denning, n. sp.—MEXICO.
Austrotinodes sp., Waltz and McCafferty, 1983—Texas (larva).
Austrotinodes sp., Kumanski, 1987—Dominican Republic (female).

Acronyms used in the text to indicate depositories of specimens are as follows: CAS (California Academy of Sciences, San Francisco, CA), DGD (D. G. Denning collection, Moraga, CA), IZAM (Instituto Zoologia Agricola, UCV, Maracay, Venezuela), MZUSP (Museu Zoologico, Universidade Sao Paulo, Brazil), NMNH (National Museum of Natural History, Smithsonian Institution, Washington, DC), UCD (University of California, Davis, CA), UPP (Fairchild Museo de Invertebrados, University of Panama, Panama), ZMC (Zoologisk Museum, Copenhagen, Denmark).

Austrotinodes chihuahua, New Species
(Figs. 1–3)

This species is near *A. sedmani* Flint. Differences are in the contour of the preanals, the short intermediate appendages, the shape of sternum 9, the clasper and the phallus.

Adult.—Length of forewing 5.5 mm. Wings in alcohol concolorous fulvous, antennae ochraceous, legs fuscous. Male genitalia: Segment 9 divided laterally and appearing as a well-developed appendage, from ventral aspect posterior margin arcuate. Tergum 10 pigmentation light brown, dorsal margin convex; from dorsal aspect, posterior margin with deep incision. Preanal appendage elongated to subacute apex, surface scabrous with abundant setae. Intermediate appendage from dorsal view with three acute spines near apex. Phallic guide black, slightly curved, apex acute. Claspers fused, coalesced to sternum 9, the elongated leaf-like lobe *a* bearing a few marginal spines, lobe *b* directed caudad. Phallus from lateral view with a small ventral process directed caudad from near base; with a slender lateral process terminating in a dark spine.

Type.—*Holotype male:* Mexico. Cuiteco, Chihuahua State, 1 Aug. 1969, T. A. Sears, R. C. Gardner, C. H. Glaser (DGD, to be deposited in UCD).

Austrotinodes freytagi, NEW SPECIES
(Figs. 4–6)

Austrotinodes sedmani Flint, 1973:140 (in part, paratype from Belice).

Related to *A. sedmani* Flint. Diagnostic differences are in the subacute apex of the preanals, the short intermediate appendage with two short spines apically, the contour of sternum 9 and the claspers. The phallus with a wide basal and narrow apical portion is also diagnostic.

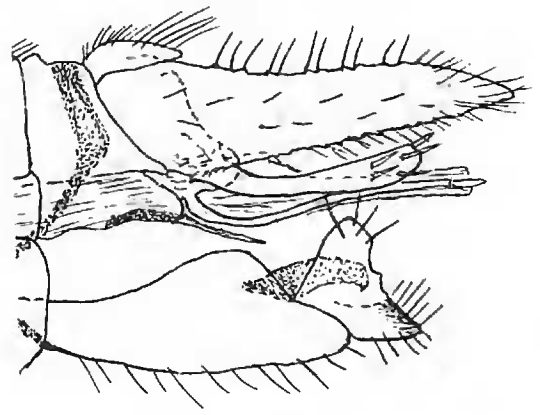
Adult.—Length of forewing 4.5 mm. General color in alcohol fulvous, antennae ochraceous. Male genitalia: Ninth segment divided laterally with sternum glabrous from ventral aspect. Tergum 10 opaque, from dorsal view, posterior margin emarginate. Preanal appendage tapering gradually to subacute apex, dorsal margin serrate. Intermediate appendage tubular, semimembranous, spine at apex and second spine subapical. Phallic guide arched, black, apex obtuse but acute from ventral aspect. Claspers fused and coalesced to sternum 9 and consist of lobe *a* lightly pigmented, elongated, best seen from ventrolateral view, *b* quadrate, lightly pigmented except black margins, setae abundant. Phallus base wide, apical portion slender; with a slender lateral process whose apex bears long, slender spine.

Types.—*Holotype male:* Honduras. El Zamorano, October–November, 1970, G. F. Freytag (DGD, to be deposited in CAS). *Paratype:* Belice. Cayo District, Mountain Pine Ridge, 27 June 1971, G. Stacell, 1 ♂ (NMNH).

Austrotinodes sedmani **Flint**
(Figs. 7–9)

Austrotinodes sedmani Flint, 1973:140.
Austrotinodes undescribed sp. "A", McElravy et al., 1981:152; 1982:307.

The collection of this species in 3 additional sites extends the known range from coastal Guatemala to the mountains of southern Costa Rica and adjacent Panama. The new collections also provide information on the variability of the species and have convinced us that the paratype from Belice is not conspecific (it is described as *freytagi*). The genitalia of specimens from no two sites are absolutely identical, nor does there appear to be any pattern in the variations. The intermediate appendages vary in the position and degree of the subapical angle, whether the apical portion is enlarged, and the number and placement of the apical setae, as



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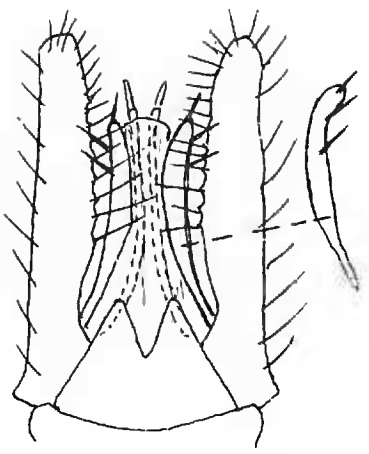

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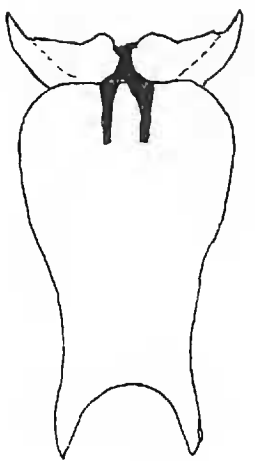

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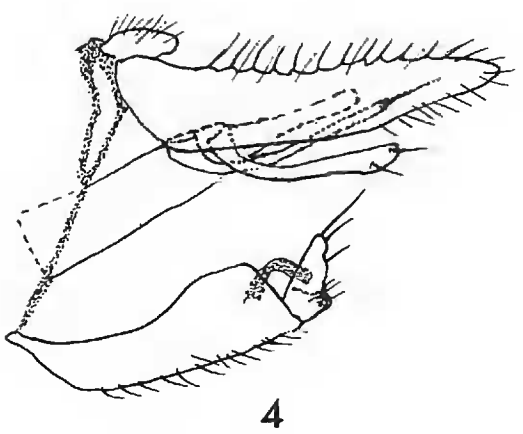

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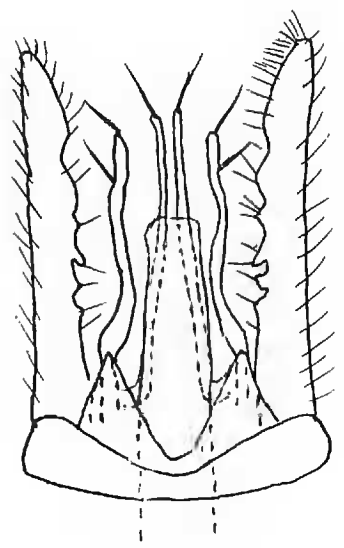

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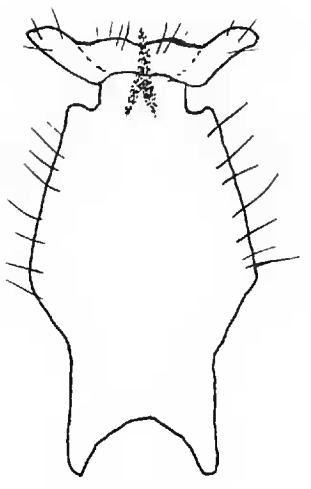

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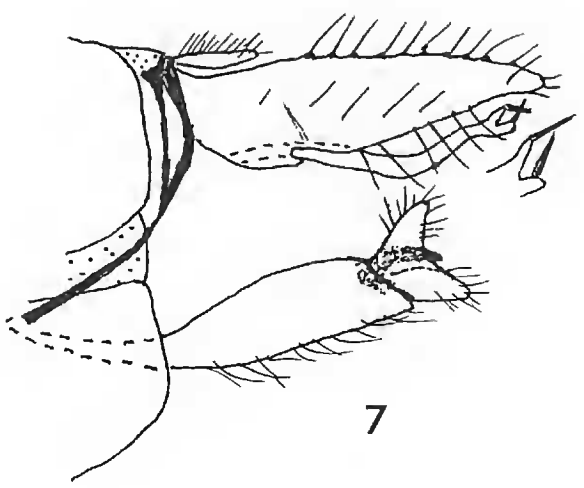

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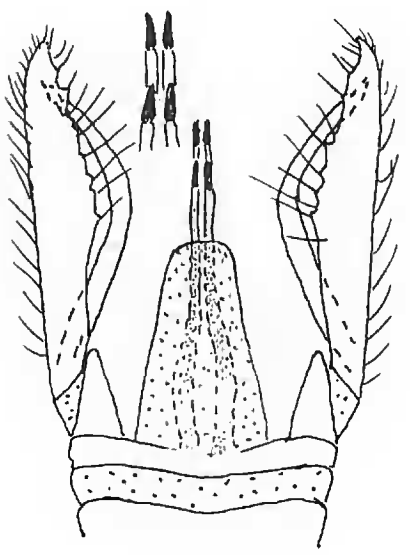

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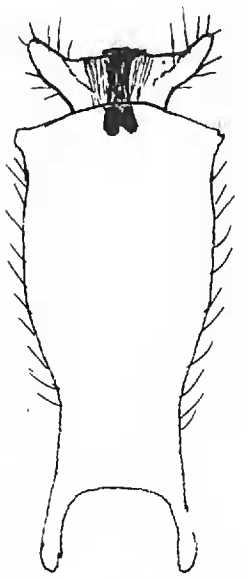

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Figures 1–9. *Austrotinodes* males. 1–3. *chihuahua.* 1. Genitalia, lateral. 2. Same, dorsal, intermediate appendage enlarged to side. 3. Claspers, phallic guide and ninth sternum, ventral. 4–6. *freytagi.* 4. Genitalia, lateral. 5. Same, dorsal. 6. Claspers, phallic guide and ninth sternum, ventral. 7–9. *sedmani,* variant from Las Cruces, Costa Rica. 7. Genitalia, lateral. 8. Same, dorsal, apex of lateral processes of phallus enlarged. 9. Claspers, phallic guide and ninth sternum, ventral.

well as the depth of the apical emargination. The lateral phallic processes are more uniform, especially its apical and subapical spines, but the basal spine may be on a short process or nearly sessile. The claspers are also quite uniform in structure, however the two northern examples have a slight mesal emargination in ventral aspect, while the southern examples are squarely truncate.

Material examined.—Costa Rica. Pcia. Puntarenas, Rio Jaba at rock quarry, 1.4 air km W Las Cruces (8.79°N, 82.97°W), 1150 m, 14 June 1986, Holzenthal et al., 1 ♂ (NMNH); Las Cruces, 20 July 1977, Evan A. Sugden, 1 ♂ (UCD). Panama. Pcia. Chiriqui, Fortuna Dam Site (8°44′N, 82°16′W), 8–14 Dec. 1976, H. Wolda, 1 ♂ (NMNH); same, but 31 Aug.–6 Sept. 1977, 1 ♂ (NMNH); same, but 5–11 Oct. 1977, 1 ♂ (UPP); same, but 23–29 Nov. 1977, 1 ♂ (NMNH).

Austrotinodes panamensis Flint

Austrotinodes panamensis Flint, 1973:138.

Light traps run by H. Wolda on Barro Colorado Island, Canal Zone, Panama consistently collected examples of this species. Some trap collections are from the canopy, others are at near ground level, and all were made during the period starting near the middle of 1977 to early 1979. A total of 60 males and 29 females were taken during this period. Of these, 38% were taken in traps at ground level, 29% in the canopy, and 36% were unspecified as to level. Emergence occurred throughout the year, with no apparent seasonal concentration.

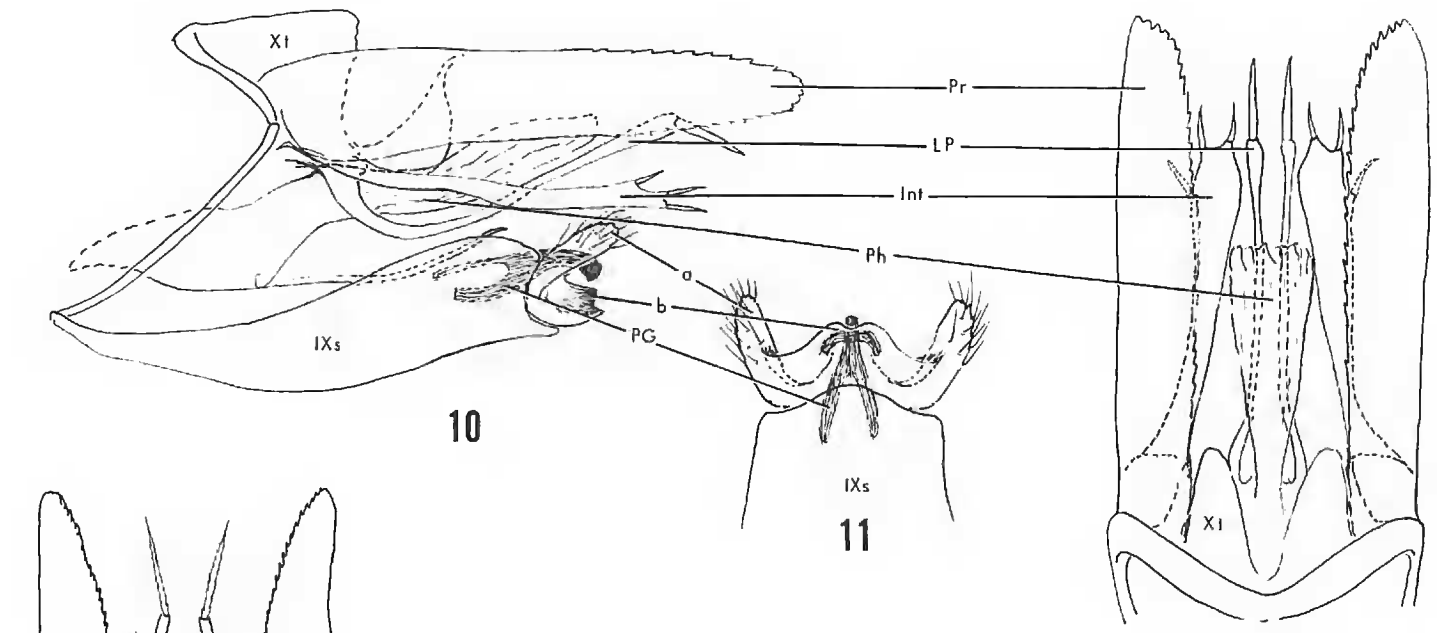
Material examined.—Panama. Panama Province, Barro Colorado Island, 23 July 1977 to 21 Jan. 1979, H. Wolda, 60 ♂, 29 ♀ (DGD, UCD, NMNH, UPP).

Austrotinodes neblinensis, New Species
(Figs. 10–12)

This distinctive species is closely related to *ancylus,* from which it is easily distinguished by the shape and spination of the intermediate appendage, the more deeply divided clasper in lateral aspect, and the absence of the short, seta-tipped, basodorsal process of the phallus.

Adult.—Length of forewing 3.5–5 mm. Color pale grey, antennae ochraceous; forewings grey, with a few darker spots, costal cell fuscous. Male genitalia: Segment 9 deeply divided, sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, tapering apicad, apex rounded, surface setose, margins crenulate. Intermediate appendage slender, elongate, flattened, tip bearing 3 slightly enlarged spines. Phallic guide slightly arched above base of claspers. Claspers reduced, fused mesally; lobe *a* narrow, semierect, well differentiated from *b,* which is produced posteriad and slightly darkened, in ventral aspect, produced mesad. Phallus with a sclerotized base and an apical membranous region beneath which is a slender, dark sclerite; bearing a very slender lateral process ending in a single, greatly enlarged seta.

Types.—*Holotype male:* Venezuela. Amazonas Federal Territory, Cerro de la Neblina, Basecamp (0°51′N, 66°10′W), Malaise Trap over small stream at east side of basecamp, 140 m, 13–15 Mar. 1984, O. S. Flint, Jr. & J. A. Louton (NMNH). *Paratypes:* Same data, 3 ♂, 1 ♀ (NMNH, IZAM).



Figures 10–18. *Austrotinodes* males. 10–12. *neblinensis*. 10. Genitalia, lateral. 11. Claspers, phallic guide and ninth sternum, ventral. 12. Genitalia, dorsal. 13–15. *ancylus*. 13. Genitalia, dorsal. 14. Same, lateral. 15. Claspers, phallic guide and ninth sternum, ventral. 16–18. *tuxtlensis*. 16. Genitalia, lateral. 17. Claspers, phallic guide and ninth sternum, ventral. 18. Genitalia, dorsal. Abbreviations: a and b—lobes *a* and *b* of the clasper, Int—intermediate appendage, LP—lateral process of phallus, PG—phallic guide, Ph—phallus, Pr—preanal appendage, IXs—ninth sternum, Xt—tenth tergite.

Austrotinodes ancylus, New Species
(Figs. 13–15)

This distinctive species is closely related to *neblinensis.* In *ancylus,* the clasper is less deeply divided in lateral aspect, the phallic guide is differently formed in ventral aspect, and the phallus bears a short, seta-tipped, basodorsal process.

Adult.—Length of forewing 4.5 mm. Color in alcohol, uniformly brown. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, tapering apicad, apex rounded, surface setose, margins crenulate. Intermediate appendage slender, elongate, apex bearing 3 enlarged spines. Phallic guide strongly arched over base of claspers. Claspers reduced, fused mesally; lobe *a* narrow, produced posterodorsally, lobe *b* receding, slightly darkened, in ventral aspect indented mesally. Phallus with a sclerotized base and an apical membranous region; bearing a slender lateral process ending in a single, very long seta; with a short basal process tipped with an enlarged seta.

Type.—Holotype male: Ecuador. Pastaza Province, Tzapino (32 km NE Tigueno at 1°11′S, 77°14′W), 400 m, 25 May 1976, J. Cohen (NMNH).

Austrotinodes tuxtlensis, New Species
(Figs. 16–18)

This species is probably most closely related to *mexicanus* Flint, from which *tuxtlensis* is distinguished by the claspers whose lobe *a* is not produced dorsad and has a distinct apicomesal excision in ventral aspect. The basodorsal process of the phallus in *mexicanus* is as long as lateral process, but it is much shorter in *tuxtlensis.*

Adult.—Length of forewing 4 mm. Color grey, antennae ochraceous; forewings grey, with a few darker spots, costal cell dark brown. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, tapering apicad, apex rounded, surface setose, margins crenulate. Intermediate appendage slender, elongate, apex bearing two enlarged spines. Phallic guide arched over base of claspers. Claspers reduced and fused mesally; lobe *a* only slightly elevated, in ventral aspect *b* darkened centrally, with a strong mesal emargination. Phallus with a sclerotized base (apical membranous region is lost), bearing a slender lateral process with a single, enlarged seta apicad; basodorsal process short, bearing a small spine.

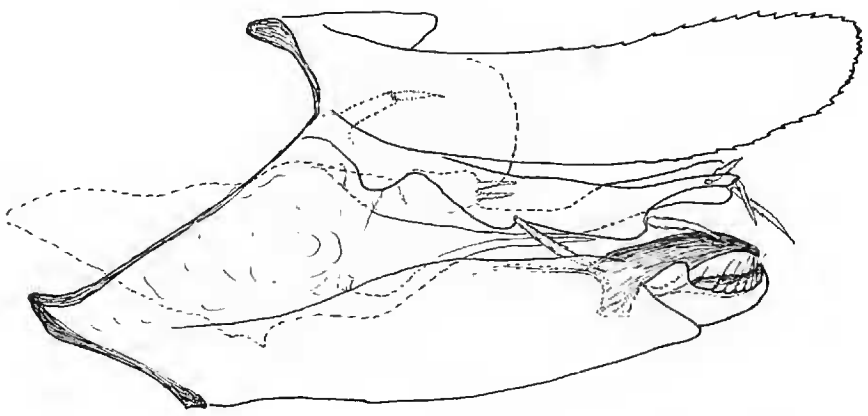
Type.—Holotype male: Mexico. Veracruz State, Los Tuxtlas area, seeps at "Las Cabanas," 8–15 May 1981, C. M. & O. S. Flint, Jr. (NMNH).

Austrotinodes fortunata, New Species
(Figs. 19–21)

Austrotinodes undescribed sp. "B", McElravy et al., 1981:152; 1982:307.

This species, *contubernalis* and *canoabo* are related, based on the formation of the intermediate appendages, claspers and lateral processes of the phallus. Lobe *b* of the claspers is produced posteriad in ventral aspect in this species, but not in the two others. The shape and setation of the intermediate appendages also differs between the three species.

Adult.—Length of forewing 4.5–5 mm. Color in alcohol, pale brown, immac-



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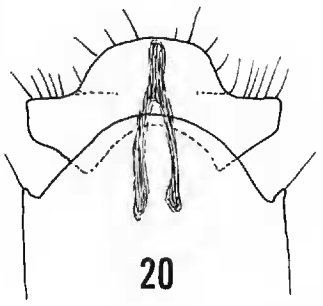

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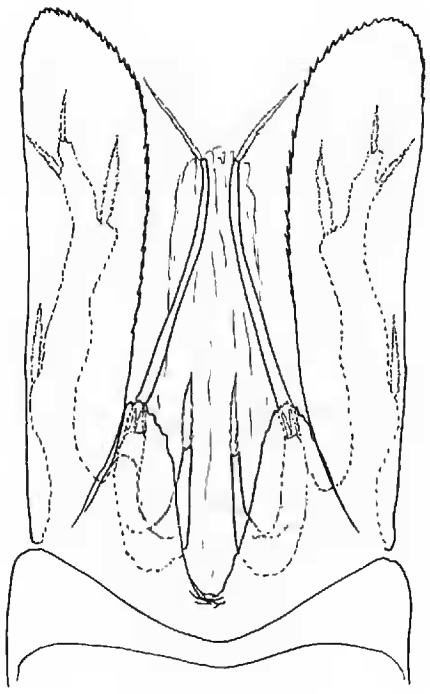

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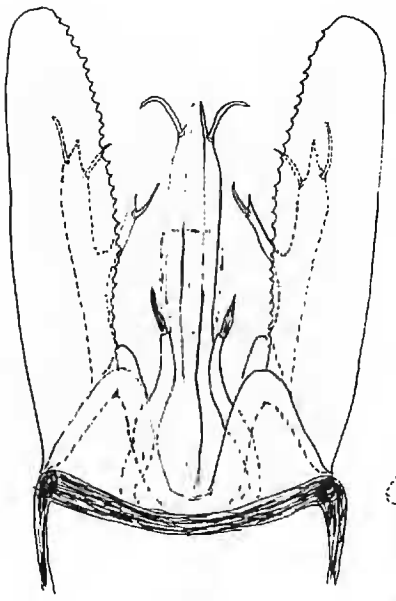

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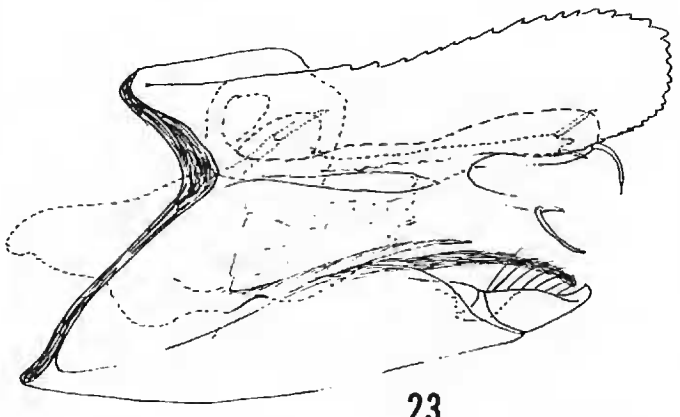

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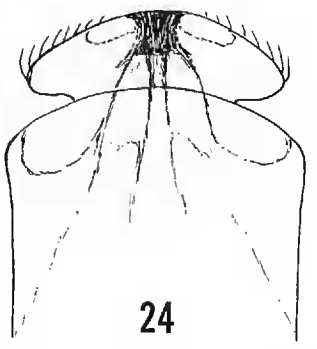

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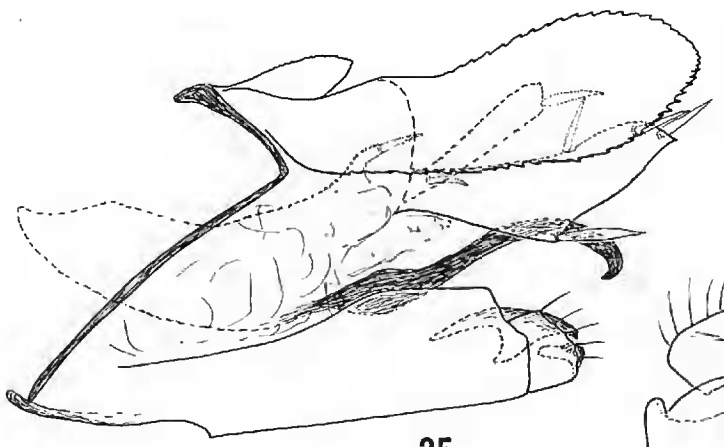

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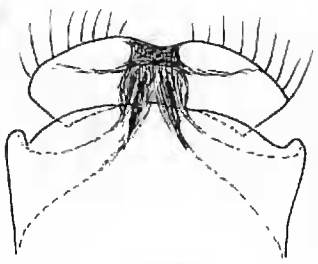

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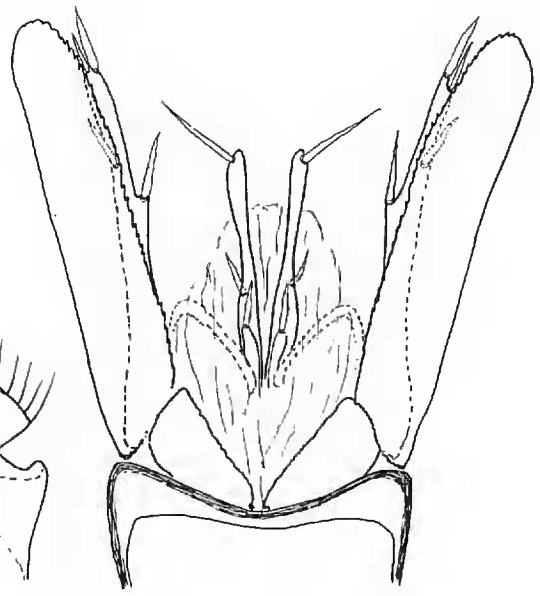

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Figures 19–27. *Austrotinodes* males. 19–21. *fortunata*. 19. Genitalia, lateral. 20. Claspers, phallic guide and ninth sternum, ventral. 21. Genitalia, dorsal. 22–24. *canoabo*. 22. Genitalia, dorsal. 23. Same, lateral. 24. Claspers, phallic guide and ninth sternum, ventral. 25–27. *contubernalis*. 25. Genitalia, lateral. 26. Claspers, phallic guide and ninth sternum, ventral. 27. Genitalia, dorsal.

ulate. Male genitalia: Segment 9 deeply divided, sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, curved slightly dorsad and tapering apicad, apex rounded, surface setose, margins crenulated. Intermediate appendage of irregular outline, bearing 4 enlarged, fimbriate spines: one ventrally

at third of length of process, second ventrally at two-thirds length, third subapically, fourth at apex. Phallic guide slightly arched over base of claspers, tapering to a small, ventrally directed apex. Claspers reduced and fused mesally; lobe *a* small, obscure in lateral aspect, but distinct in ventral view, lobe *b* produced posteriad, darkened with dorsal margin serrate and apex produced into a small tooth. Phallus with a sclerotized base and an apical membranous region beneath which is a slender, dark sclerite; bearing a thin lateral process, subbasally enlarged and bearing two small spines, and ending in a single, greatly enlarged seta; the short basodorsal process bearing a large apical spine.

Types.—Holotype male: Panama. Chiriqui Province, Fortuna Dam Site (8°44′N, 82°16′W), 14–20 Sept. 1977, H. Wolda (NMNH). *Paratype:* Same, but 13–19 Apr. 1977, 1 ♂ (NMNH).

Austrotinodes canoabo, New Species
(Figs. 22–24)

As mentioned for *fortunata,* this species and *contubernalis* are related. The virtually identical contour of the claspers when viewed from ventral aspect would seem to indicate the closest relationship is to *contubernalis.* The most distinctive characteristic of *canoabo* is the deeply forked intermediate appendage which is not forked in *contubernalis.*

Male.—Length of forewing 4 mm. Color grey, antennae ochraceous; forewing light grey, with scattered dark spots, costal margin mostly dark grey. Male genitalia: Segment 9 deeply divided, sternum elongated, apical margin in ventral aspect evenly convex. Preanal appendage long, parallel-sided, apex rounded, surface setose, margins crenulated. Intermediate appendage long, divided apicad into dorsal branch ending in 2 enlarged setae, and ventral branch ending in 1 long seta. Phallic guide very long, slender, nearly straight reaching apex of clasper lobe *b.* Claspers reduced and fused mesally; lacking lobe *a,* tip of *b* slightly produced in lateral aspect, in ventral aspect evenly convex with mesal portion blackened. Phallus with a sclerotized base, apically an elongate membranous lobe beneath which a dark, slender, tongue-like sclerite; with an elongate, slender process laterad ending in an enlarged, decurved seta, and a short, seta-tipped process basomesad.

Type.—Holotype male: Venezuela. Carabobo State, near Canoabo, 850 m, 24 Jan. 1983, O. S. Flint, Jr. (NMNH).

Austrotinodes contubernalis, New Species
(Figs. 25–27)

Austrotinodes undescribed sp. "B", McElravy et al. 1981:152; 1982:307 (in part, male of 28 Dec. 1977–3 Jan. 1978).

The claspers are similar to *canoabo* in ventral aspect where both species appear almost identical. In lateral aspect they differ in lobe *b* of the clasper which is much shorter in *contubernalis.* There are also differences in the intermediate appendages, phallic guide, and lateral processes of the phallus.

Adult.—Length of forewing 4.5 mm. Color in alcohol, fulvous. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect evenly convex. Preanal appendage long, slightly widened subapically, apex round-

ed, surface with abundant setae, margins crenulated. Intermediate appendage long, broad at midlength, tapering apicad, with a seta middorsally, 2 apically, and another midventrally. Phallic guide gently curved, reaching tip of clasper lobe *b*. Claspers reduced, fused mesally; lobe *a* narrow, produced laterad, apex of *b* slightly produced in lateral aspect; in ventral aspect convex with central portion blackened and slightly indented. Phallus with a sclerotized base, apically an elongate membranous lobe beneath which is a dark, slender, tongue-like sclerite whose apex is hooked ventrad; with an elongate, lateral process curved upwardly, with a seta basoventrad and ending in an enlarged seta; a short, seta-tipped process basomesad.

Type.—Holotype male: Panama. Chiriqui Province, Fortuna Dam Site (8°44′N, 82°16′W), 28 Dec. 1977–3 Jan. 1978, H. Wolda (NMNH).

Austrotinodes fuscomarginatus, New Species
(Figs. 28–30)

This species is similar to *paraguayensis,* from which it is distinguished by the shape and spination of the basomesal process of the preanal appendage, and the outline of lobe *a* of the claspers.

Adult.—Length of forewing 4–5 mm. Color grey, antennae ochraceous; forewings grey, with a few darker spots, costal cell fuscous. Male genitalia: Segment 9 deeply divided, with sternum elongated, produced apicodorsally into a broad lobe, apical margin in ventral aspect strongly convex. Preanal appendage long, almost parallel-sided, apex rounded, surface setose, margins crenulate. Intermediate appendage long, slightly enlarged apicad, bearing 4 prominent spines. Phallic guide attains apex of clasper lobe *b*. Claspers reduced, fused mesally; lobe *a* slightly elevated, with lobe *b* distinctly produced, angled dorsad, in ventral aspect darkened centrally, and produced posteriad. Phallus with a sclerotized base and an apical membranous lobe beneath which is a slender, black sclerite; bearing a long, slender, lateral process with a single, enlarged seta subapically; basomesal processes short, with a long apical seta.

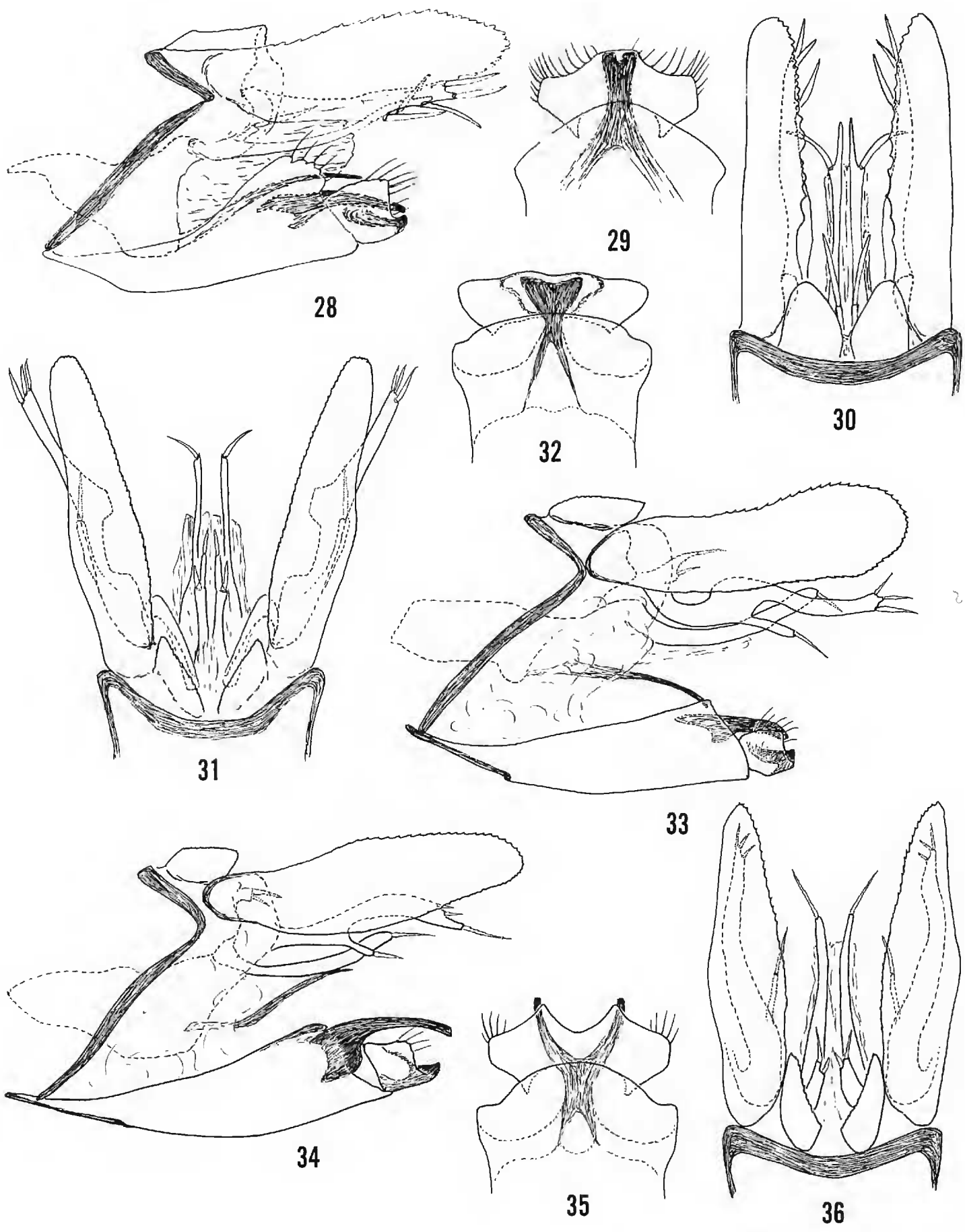
Types.—Holotype male: Venezuela. Amazonas Federal Territory, Cerro de la Neblina, Camp IV (0°58′N, 65°57′W), 760 m, 15–18 Mar. 1984, O. S. Flint, Jr. (NMNH). *Paratypes:* Same data, 3 ♀; same, but Malaise Trap over dry stream channel, 6 ♀ (NMNH, IZAM).

Austrotinodes paraguayensis Flint

Austrotinodes paraguayensis Flint, 1983:22.

This species, recently described from Paraguay, is now recorded from central Brazil. The Brazilian specimen agrees with the type in detail except the brazilian example has a much longer dark sclerite ventrally on the phallus and its phallic guide is almost truncate apically. Figure 61 (Flint, 1983) is incorrect in that it shows a single lateral process of the phallus bearing a subapical seta on each side. There are, as in all other species, 2 processes in *paraguayensis,* each with a single lateral seta. The process in figure 61 should have been divided down the midline.

Material examined.—Brazil. Minas Gerais State, Serra do Cipo, Rio Capivara, 29 Apr. 1973, C. G. Froehlich (212), 1 ♂ (MZUSP).



Figures 28–36. *Austrotinodes* males. 28–30. *fuscomarginatus.* 28. Genitalia, lateral. 29. Claspers, phallic guide and ninth sternum, ventral. 30. Genitalia, dorsal. 31–33. *ariasi.* 31. Genitalia, dorsal. 32. Claspers, phallic guide and ninth sternum, ventral. 33. Genitalia, lateral. 34–36. *amazonensis.* 34. Genitalia, lateral. 35. Claspers, phallic guide and ninth sternum, ventral. 36. Genitalia, dorsal.

Austrotinodes ariasi, New Species
(Figs. 31–33)

This species is related to *amazonensis,* from which it is distinguished by the different form of the intermediate appendages, and especially by the phallic guide

which in ventral aspect is only slightly indented apically rather than deeply divided.

Adult.—Length of forewing 4 mm. Color in alcohol, uniformly pale brown, costal margin of forewing appearing darker. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, apex rounded, surface setose, margins crenulate. Intermediate appendage long, angled and sinuate, with a seta-tipped ventral process, apex with 3 enlarged spines, in dorsal aspect with a distinct midlength enlargement. Phallic guide slightly arched, in ventral aspect widened and slightly emarginate apically. Claspers reduced and fused mesally; lobe *a* slightly elevated, with lobe *b* short and truncate, in ventral aspect with posterior margin only slightly sinuate. Phallus with a sclerotized base and an apical membranous lobe, beneath which is a slender dark sclerite; lateral process long, slender, with a single, enlarged seta apically; basomesal processes short, with two enlarged spines, one apically the other ventrally and subapically.

Type.—*Holotype male:* Brazil. Amazonas State, Reserve Ducke, Hwy. Am. 010, km 26, 31 May 1979, J. Arias, light trap 20 m high (MZUSP).

Austrotinodes amazonensis, New Species
(Figs. 34–36)

This species is closely related to the preceding species, *ariasi,* from which it is distinguished by the different shape and spination of the intermediate appendage, the projections from the posterior margin of the claspers, and the deeply divided apex of the phallic guide.

Adult.—Length of forewing 4 mm. Color grey, antennae ochraceous; forewings grey mostly denuded, costal cell darker. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect strongly convex. Preanal appendage long, apex rounded, surface setose, margins crenulate. Intermediate appendage long, sinuate, with a seta-tipped ventral process, apex with 3 enlarged spines (in paratype these spines on very elongate bases). Phallic guide slightly arched, in ventral aspect deeply divided apically. Claspers reduced and fused mesally; lobe *a* slightly elevated, with lobe *b* distinctly produced, in ventral aspect with posterior margin produced into 2 sharp angles. Phallus with sclerotized base and an apical membranous lobe, beneath which is slender dark sclerite; lateral process long, slender, with a single, enlarged seta apically; basomesal process, short, with two enlarged apical spines.

Types.—*Holotype male:* Brazil. Amazonas State, Hwy. Am. 010, km 246, 20 km W Itacoatiara, 15–16 July 1979, J. Arias et al. (MZUSP). *Paratypes:* Same data, 3 ♀ (MZUSP, NMNH); same, but 12–15 July 1979, 1 ♂ (NMNH).

Austrotinodes bracteatus, New Species
(Figs. 37–39)

This, and the following species, *prolixus,* are unusual species with little resemblance to others in the genus. The structure of the basolateral phallic plates of both species present diagnostic differences; in *bracteatus* the plate is short, while in *prolixus* the apical spine is borne on a long, slender process. Other differences between the two species are in the intermediate appendages, in the phallic guides and claspers.

Adult.—Length of forewing 5 mm. Color in alcohol, brown, forewing a bit darker in costal cell. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect convex. Preanal appendage long, tapering apicad, apex rounded, surface setose, margins crenulate. Intermediate appendage slender, elongate, bearing 4 enlarged spines apicad. Phallic guide short, attaining base of claspers, in ventral aspect with apex flared. Claspers reduced and fused mesally; lobe *a* small, almost quadrate in lateral aspect, lobe *b* receding, slightly darkened, in ventral aspect posterior margin almost straight. Phallus with a sclerotized base and a very short apical membranous region; bearing a broad, strongly sclerotized basolateral plate bearing 4 long spines along its ventral and apical margins.

Type.—*Holotype male:* Brazil. Sao Paulo State, Paranapiacaba Biological Station, 13 Dec. 1963, C. G. Froehlich (39) (MZUSP).

Austrotinodes prolixus, New Species
(Figs. 40–42)

This species is closely related to *bracteatus.* It is easily differentiated by the structures of the basolateral plate of the phallus, intermediate appendage, phallic guide and claspers.

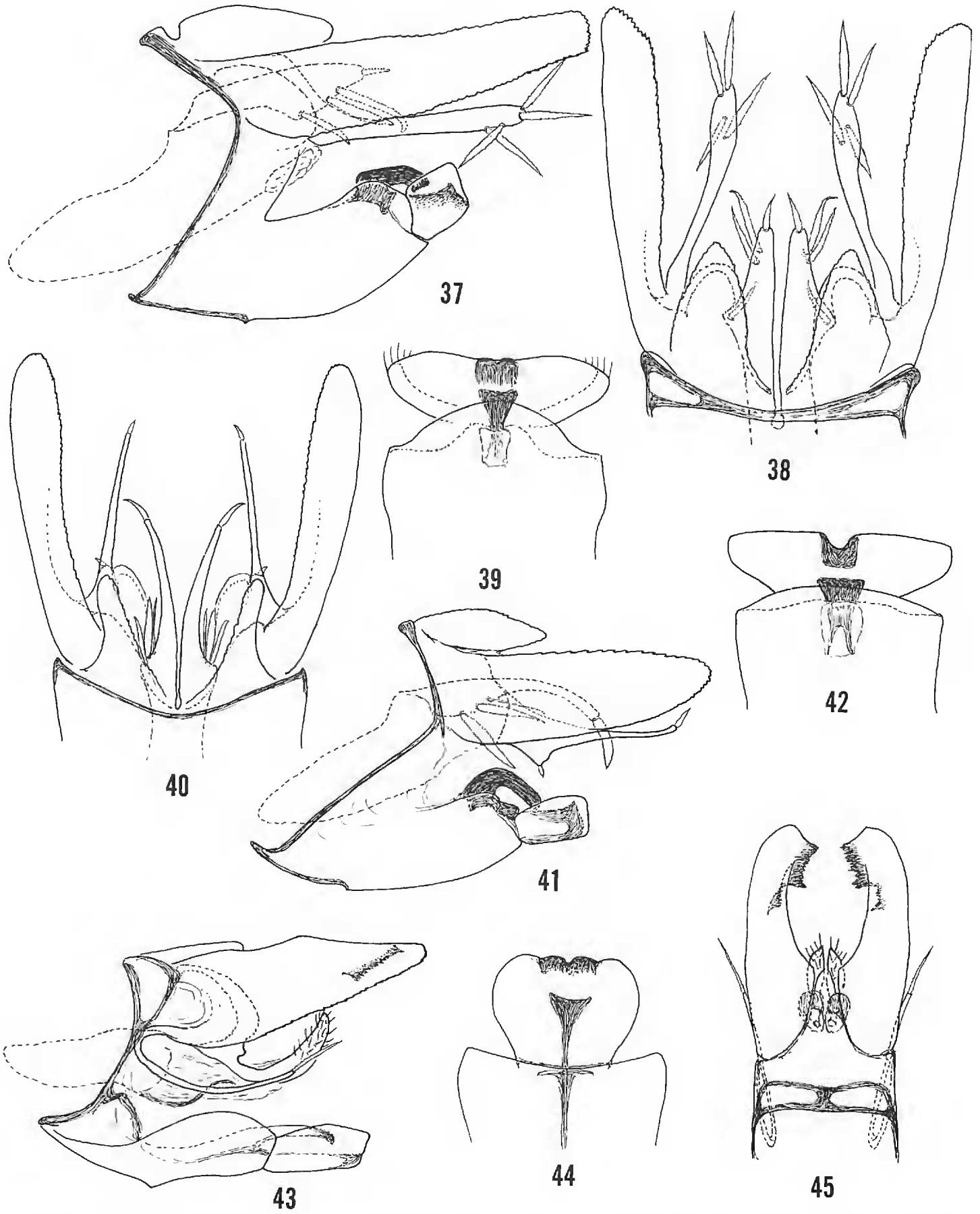
Adult.—Length of forewing 4.5–5 mm. Color in alcohol, uniformly brown. Male genitalia: Segment 9 deeply divided, with sternum elongated, apical margin in ventral aspect slightly convex. Preanal appendage long, tapering apicad, apex rounded, surface setose, margins crenulate. Intermediate appendage, broad basally, apicoventral angle bearing a short, broad seta, apex slender, bearing an enlarged spine. Phallic guide short, angled basally, attaining base of claspers, in ventral aspect with apex flared. Claspers reduced and fused mesally; lobe *a* small, almost rectangular in lateral aspect, lobe *b* receding, slightly darkened, in ventral aspect posterior margin almost straight with a mesal emargination. Phallus with a sclerotized base and a very short apical membranous region; bearing a strongly sclerotized basolateral plate, widened basad, slender and elongate apically, bearing 2 enlarged and 1 slender spine (lacking in some examples) along its basoventral margin and 1 large spine apically.

Types.—*Holotype male:* Brazil. Minas Gerais State, Chapeau de Sol, km 110, Serra du Cipo, 21 Dec. 1974, C. G. Froehlich (413) (MZUSP). *Paratypes:* Same, but Caminho da Usina, 7 July 1974 (356), 1 ♂ (NMNH); same, but km 126, 17 Dec. 1974 (406), 1 ♂ (MZUSP); same, but 17 Apr. 1975 (417), 2 ♂ (MZUSP, NMNH).

Austrotinodes nielseni, New Species
(Figs. 43–45)

This species is very similar to *angustior* Schmid and *armiger* Flint. From both it is distinguished by the intermediate appendage which makes a deep curve basally from its origin; in the above mentioned species the anterior margin of the preanal appendage is vertical and the process is immediately curved posteriad. The claspers of *nielseni* differ from the others in not having lobe *a* extending further posteriad than lobe *b.* There are also differences in the proportional lengths and widths of the preanal appendages and their internal shelves between all species.

Adult.—Length of forewing 5.5 mm. Color in alcohol, uniformly dark brown. Male genitalia: Ninth segment deeply divided laterally, ventral section prolonged



Figures 37–45. *Austrotinodes* males. 37–39. *bracteatus*. 37. Genitalia, lateral. 38. Same, dorsal. 39. Claspers, phallic guide and ninth sternum, ventral. 40–42. *prolixus*. 40. Genitalia, dorsal. 41. Same, lateral. 42. Claspers, phallic guide and ninth sternum, ventral. 43–45. *nielseni*. 43. Genitalia, lateral. 44. Claspers, phallic guide and ninth sternum, ventral. 45. Genitalia, dorsal.

posteriad. Preanal appendage long, tapering regularly from base to apex, mesal surface apically with a short, dark, shelf-like lobe; bearing a slender basolateral process whose base makes a large loop directed anteriad before curving posteriad and bearing a large apical seta. Intermediate appendage slender, curved, apex with scattered enlarged setae. Phallic guide long, slender, apex slightly hooked ventrad,

in ventral aspect sharply widened. Claspers fused mesally, darkened apicomesally; lobe *a* thin, not produced posteriad beyond lobe *b* in ventral aspect. Phallus tubular, membranous apically with a darkened apicoventral sclerite.

Types.—Holotype male: Argentina. Rio Negro Province, Puerto Blest, Lago Nahuel Huapi, 770 m, 1–6 Jan. 1982, Nielsen & Karsholt (ZMC). *Paratype:* Same, but 5 Jan. 1979, Mision Cientifica Danesa, 1 ♂ (NMNH).

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Literature Cited

Flint, O. S., Jr. 1969. Studies of Neotropical caddisflies, IX: new genera and species from the Chilean Subregion (Trichoptera). Proc. Ent. Soc. Wash., 71:497–514.

———. 1973. Studies of Neotropical caddisflies, XVI: the genus *Austrotinodes* (Trichoptera: Psychomyiidae). Proc. Biol. Soc. Wash., 80:127–142.

———. 1983. Studies of Neotropical caddisflies, XXXIII: new species from Austral South America (Trichoptera). Smiths. Contrib. Zool., 377:1–100.

Kumanski, K. P. 1987. On caddisflies (Trichoptera) of Cuba. Acta Zool. Bulgarica, 34:3–35.

McElravy, E. P., V. H. Resh, H. Wolda, and O. S. Flint, Jr. 1981. Diversity of adult Trichoptera in a "non-seasonal" tropical environment. Proc. of the 3rd Int. Symp. on Trichoptera:149–156.

Navas, L. 1934. Insectos Suramericanos, novena serie. Rev. Acad. Cienc. Madrid, 31:155–184.

Schmid, F. 1955. Contribution a la connaissance des Trichopteres Neotropicaux. Mem. Soc. Vaud. Sci. Nat., 11:117–160.

———. 1958. Contribution a la connaissance des Trichopteres Neotropicaux III. Mitt. Zool. Mus. Berlin, 34:183–217.

———. 1964. Contribution a la connaissance des Trichopteres Neotropicaux V. Tijd. v. Entom. 107:307–339.

Wolda, H. and F. W. Fisk. 1981. Seasonality of tropical insects. II. Blattaria in Panama. J. Animal Ecol., 50:827–838.